LP1050DC Installation and Reference Manual

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Installation

print this topic

Features

The LP1050DC host bus adapter offers a highly integrated 2Gb/s Fibre Channel HBA for use in servers based on either the conventional PCI or PCI-X 1.0a expansion bus architectures. The LP1050DC delivers exceptional performance through the use of a sixth generation Emulex Thor controller. The Thor high-performance controller is a highly integrated dual-channel device that combines industry standard embedded ARM9 processors, 1Gig/2Gig SERDES and protocol technology into a single module. The LP1050DC is a dual-channel HBA in a low-profile PCI (MD2) compliant card format.

Major Features

- Full duplex 2Gb/s Fibre Channel delivering up to 400MB/s (per channel)
- Superior transaction processing performance
- Automatic speed negotiation
- Automatic topology detection
- Full fabric support using F_Port and FL_port connections
- Onboard hardware context cache for superior fabric performance
- Support for use of multiple concurrent protocols (SCSI and IP)
- Full support for both FC service class 2 and 3
- Full fabric support in x86 and Itanium environments
- Support for FC-Tape (FCP-2) devices
- 66/100/133 MHz PCI-X 1.0a and PCI 2.3 compatibility
- End-to-end parity protection for high data integrity
- Robust suite of software supporting Windows Server 2003, Windows 2000, Windows NT, Linux and NetWare
- 3.3V signaling, 5V tolerant
- Optical small form factor (LC) interface

Compatibility

Software Environments	Windows Server 2003, Windows 2000, Windows NT, Novell Netware and Linux
Hardware Environments	PCI hardware platforms: Itanium Processor Family (for IA-64) and x86 (for IA-32) platforms

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Prerequisites

- PCI/PCI-X 32- and 64-bit data and addressing
- PCI bus computer with a clock rate up to 66 MHz
- PCI-X bus computer with a clock rate up to 133 MHz
- Media and connectors

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Install the Host Bus Adapter Board

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Caution Emulex LightPulse® Host Bus Adapters (HBAs) contain electronic components that can be damaged by static electricity through an electrostatic discharge (ESD) event. To prevent ESD damage, maintain constant contact with any grounded metal surface. A grounding wrist strap is useful for this purpose. Handle the card carefully at all times and preferably by the edges. Avoid touching electronic components and keep the card in the original packaging until you are ready for installation.

1. Record IEEE and serial numbers.

   Each host bus adapter (HBA) is shipped with a unique 64-bit identifier called the IEEE address. The Fibre Channel industry uses a World Wide Name (WWN) derived from the IEEE address, and this number is needed for Fibre Channel connectivity. Since this adapter has two ports, there are two IEEE addresses. The IEEE address is used when configuring your system. The serial number is used when communicating with Emulex. All numbers are clearly marked on the board. We recommend that you record these numbers before installation.

2. Turn off and unplug the computer.
3. Remove the computer case.

   Note For best I/O performance, place the adapter into an empty PCI-X slot that is running at 133 MHz. Ensure that the PCI bus is not shared with another PCI card that can lower the PCI slot clock rate.

4. Remove the blank panel from an empty 32- or 64-bit PCI or PCI-X bus slot. Compare the removed panel to the bracket on the host bus adapter. Follow steps 5-8 to change the bracket if they are different sizes. Otherwise, skip to step 9.

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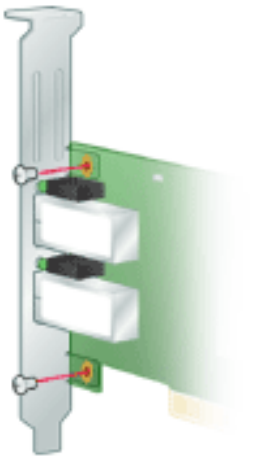
Note The host bus adapter comes with a standard PCI bracket installed. The low-profile mounting bracket is shorter than the standard bracket; approximately 3.11 in. (7.9 cm) compared to 4.75 in. (12.06 cm) long.

If you need a low-profile bracket, contact Emulex Product Information by phone at 800-EMULEX-3 (800-368-5393) or 714-885-3450, or by e-mail at info@emulex.com. A low-profile bracket will be shipped within one business day.

5. Remove the mounting bracket screws from the top of the host bus adapter.
6. Remove the bracket and store it for future use.
7. Align the new mounting bracket tabs with the holes in the HBA.



Note Be careful not to push the bracket past the transceiver housing's grounding tabs.

Make sure the LEDs are properly aligned with the holes in the bracket.

8. Replace the screws that attach the HBA to the bracket.
9. Insert the host bus adapter into the empty 32- or 64-bit PCI or PCI-X bus slot. Press firmly until the adapter is seated.
10. Secure the host bus adapter's mounting bracket to the case with the panel screw or clip.
11. Replace the computer case and tighten case screws.

The host bus adapter is now installed in the PC and is ready for media attachment.

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Attach Media

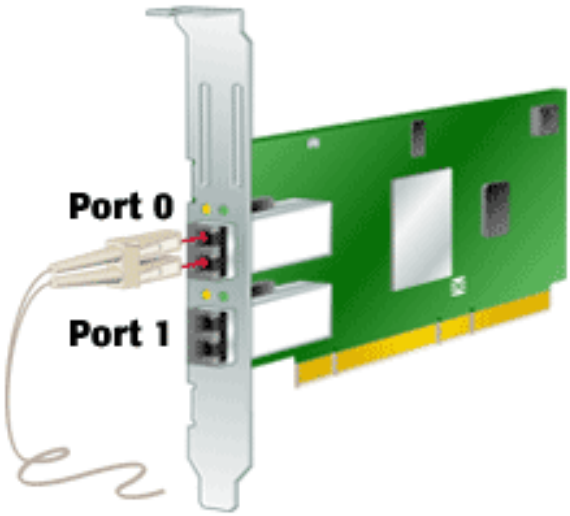
Note The host bus adapter (HBA) will not allow normal data transmission on an optical link unless it is connected to another similar or compatible laser product (that is, multimode to multimode.)

Use multimode fiber optic cable, with short-wave lasers, that adheres to the following specifications:

Fiber Optic Cable	Maximum Length	Minimum Length	Connector
62.5/125 µm (multimode)	300 meters at 1.0625 Gb/s 150 meters at 2.125 Gb/s	2 meters	LC
50/125 µm (multimode)	500 meters at 1.0625 Gb/s 300 meters at 2.125 Gb/s	2 meters	LC

1. Connect the fiber optic cable to the LC connector on the HBA.

2. Connect the other end of the cable to the Fibre Channel device.



After the media is connected to the host bus adapter, you are ready to apply power to the computer.

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Apply Power

1. Verify that the host bus adapter is securely installed in the computer.
2. Verify that the correct media is attached.
3. Plug in and turn on the computer.
4. Observe LEDs for Power On Self Test (POST) results.

View LEDs

Green and yellow LEDs can be seen through openings in the host bus adapter's mounting bracket. Green indicates power and yellow signifies port activity. Each port has a corresponding set of green and yellow LEDs.

POST conditions and results are summarized in the following table.

Yellow LED	Green LED	State
OFF	OFF	Wake-up failure (dead board). Check the 3.3V LED near the top edge of the HBA (component side).* If this LED is lit, the slot is providing 3.3V power.
ON	OFF	POST failure (dead board)
Slow blink (1 Hz)	OFF	Wake-up failure (dead board)
Fast blink (4 Hz)	OFF	Failure in POST (dead board)
Flashing (irregular)	OFF	POST processing in progress
OFF	ON	Failure while functioning

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ON	ON	Failure while functioning
Slow blink	ON	Normal operating condition - 1 GHz link rate
Fast blink	ON	Normal operating condition - 2 GHz link rate
OFF	Slow blink	Normal - link down or not yet started
Slow blink	Slow blink	Offline for download
Fast blink	Slow blink	Restricted offline mode (waiting for restart)
Flashing	Slow blink	Restricted offline mode, test active

*A light-emitting diode (LED) is located near the top edge of the board. This LED indicates 3.3V power.

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Reference

Specifications

Parameter	Range
Media Interface	The Thor controller interfaces to the physical media through an FC-0 Media Interface (FC-PI compliant transceiver), and then connects through a single optical fiber LC connector.
Physical Dimensions	Low-profile MD2 form factor, 6.600 inches by 2.536 inches, and accommodates both the full-height and low-profile bracket.
Power Requirements	In a PCI/PCI-X, 66-MHz host: • 2.0 watts (typical) @ +3.3 VDC • 6.1 watts (typical) @ +5.0 VDC • 8.1 watts (total typical) In a PCI-X, 100/133-MHz host: • 2.4 watts (typical) @ +3.3 VDC • 6.8 watts (typical) @ +5.0 VDC • 9.2 watts (total typical)
Airflow	100 lf/min (minimum)
Temperature	32° to 113° F (0° to 45° C), Operating -40° to 158° F (-40° to 70° C), Storage
Humidity	5% to 95% non-condensing
Agency Approvals for LP1050DC	Class 1 Laser Product per DHHS 21CFR (J) & EN60825-1 UL recognized to UL1950 CUR recognized to CSA 22.2, No. 950 Baurt-certified by TUV to EN60950 FCC Rules, Part 15, Class A Industry Canada, ICES-003, Class A EMC Directive 89/336/EEC (CE Mark) EN55022, Class A EN55024 Australian EMC Framework (C-Tick Mark) AS/NZS 3548:1995 Class A Japan VCCI, Class A Taiwan BSMI, Class A Korea MIC, Class A

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FCC and Regulatory Notices

CLASS 1 LASER PRODUCT
LASER KLASSE 1
LUOKAN 1 LASERLAITE
APPAREIL A` LASER DE CLASSE 1

LP10000DC-M2, LP10000-M2, LP1050DC-F2 and LP1050-F2 Models

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party: Paul Folino, Chief Executive Officer
Emulex Corporation (714) 662-5600
3535 Harbor Blvd. Costa Mesa, CA Corporation 92626 USA

Note:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Shielded cables must be used between this equipment and attached peripheral devices. The reader is cautioned that changes or modifications made to the equipment not expressly approved by Emulex could void the user's authority to operate this equipment. The above statement applies to products marketed in the USA

This class A digital apparatus meets all requirements of the Industry Canada (IC) Interference - Causing Equipment Standard (ICES-003).

Cet appareil numerique de la Classe A respecte toutes les exigences du reglement sur le materiel brouilleur du Canada. This statement applies to products marketed in Canada.

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Notice for Japan and Translations (VCCI)

Product Label

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. VCCI—A

この装置は，クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI－A

Manual Notice

Translation:

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

この装置は，情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Notice for Taiwan and Translations (BSMI)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Translation:

This equipment is a Class A ITE, and operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

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Notice for South Korea and Translations (MIC)

사용자 안내문 (A급 기기)
본 기기는 업무용으로 전자파적합등록을 받은 기기이오니 , 만약 잘못 구입하셨을 때에는 구입한 곳에서 비업무용으로 교환하시기 바랍니다 .

Translation:

Class A Equipment: Please note that this equipment has been approved for business purposes with regards to electromagnetic interference. If purchased in error for use in a residential area, you may wish to exchange the equipment where you purchased it.

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Declaration of Conformity

LP10000DC-M2, LP10000-M2, LP1050DC-F2 and LP1050-F2 Models

This equipment complies with CISPR22/EN55022 Class A.

Warning	This is a class A product. In a domestic environment, this product may cause radio interference requiring the user to take adequate measures.
Note	Changes or modifications not expressly approved by Emulex Corporation could void the user's authority to operate this equipment.

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We network storage

DECLARATION OF CONFORMITY

Manufacturer: Emulex Corporation
3535 Harbor Blvd.
Costa Mesa, California 92626 USA

declares under sole responsibility that the product:

Product Name: LightPulse™ Fibre Channel PCI-X Host Bus Adapter
Models: LP10000DC-M2, LP10000-M2, LP1050DC-F2, LP1050-F2
Assembly Numbers: FC1020055-XX (FC1010493-XX), FC10200059-XX (FC1010496-XX)

To which this Declaration relates is in conformity with the following standards or other documents for Information Technology Equipment (ITE):

Product Safety:
UL Recognized to UL1950
CUR Recognized to CSA22.2, No. 950
IEC 950 (1991) + Amendments 1,2,3,4, and 11
EN 60950 (1992) + Amendments 1,2,3,4, and 11
EN 60825-1 (1994) + Amendment 11
EN 60825-2 (1994)
CFR Title 21, Laser AEL Class 1, FDA/CDRH

EMC:
FCC Rules, CFR Title 47, Part 15, Subpart B, Class A
Industry Canada, ICES-003, Class A
EN55022 (1998) / CISPR 22 (1997) Class A, EN55024 (1998)
AZ/NZS 3548:1995, Class A
VCCI, Class A
CNS 13438 (1997) Class A, KN22 (2000) Class A, KN24 (2000) Class A

Supplementary Information:
1. The Product was tested in a typical configuration.
2. The product complies with the requirements of the following directives:
   - European Union Low Voltage Directive 73/23/EEC
   - European Union EMC Directive 89/336/EEC (as amended by 92/31/EEC)
   - CE-Marking Directive 93/68/EEC (Carries the CE-Mark accordingly)
   - Australian EMC Framework (Carries the C-Tick mark accordingly)

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- European Union Low Voltage Directive 73/23/EEC
- European Union EMC Directive 89/336/EEC (as amended by 92/31/EEC)
- CE-Marking Directive 93/68/EEC (Carries the CE-Mark accordingly)
- Australian EMC Framework (Carries the C-Tick mark accordingly)

Emulex Documentation, Drivers and Software

July 31, 2003
Costa Mesa, CA.

Paul Folino, Chief Executive Officer

European Contact:

Emulex Corporation
7 & 8 Forest Court
Oaklands Park
Fishponds Road
Wokingham, Berkshire
RG41 2FD, England

Telephone: 44-118-977-2929
Fax: 44-118-977-3237

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Laser Safety Notice

This laser safety information contains certification and product information covering laser products known as optical Gigabaud Link Modules (GLMs), Gigabit Interface Converters (GBICs), 1x9 and small form factor transceivers sold as accessories to or incorporated in Emulex LightPulse host adapters. The GLM, GBIC, 1x9 and small form factor transceiver are the primary cable connection mechanisms for any optical port on the host adapter and hub. This data is not intended to be a replacement for any safety regulations and standards; relevant safety documents should always be consulted if necessary. Contact Emulex Corporation with any questions or concerns about laser safety.

Certification and Classification
Labeling Requirements
Product Information
Usage Restrictions
System Level Certification

Certification and Classification

LP6000 and LP7000E PCI host adapters may contain a laser product known as an optical Gigabaud Link Module (GLM). The optical GLM is attached to the host adapter using an 80-pin connector and extends through the mounting bracket. In turn, the host adapter can be inserted into any host system's PCI slot.

The LH5000 hub may contain a laser product known as a Gigabit Interface Connector (GBIC). The GBIC provides the physical connector to the optical cable. The GBIC can be inserted into any pluggable hub port.

The LP8000, LP850 and LP9000 PCI host adapter may contain a laser product known as a Gigabit Interface Converter (GBIC) or an embedded 1x9 transceiver. The GBIC and or 1x9 transceiver provide the physical connection to the optical cable, and its SC-style connector extends through the mounting bracket. In turn, the host adapter can be inserted into any host system’s PCI slot.

The LP9002, LP9002L, LP952L, LP9002S, LP9002DC, LP9002C, LP9402DC, LP9802, LP982, LP9802DC, LP10000, LP10000DC, LP1050DC and LP1050 host adapters may contain a laser product known as a small form factor transceiver. This transceiver provides the physical connection to the optical cable, and its LC-style connector extends through the mounting bracket. In turn, the host adapter can be inserted into any host system's appropriate PCI/PCI-X/cPCI/SBus expansion slot.

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In the United States, all optical GLMs, GBICs, 1x9 and small form factor transceivers sold by Emulex are certified as Class 1 laser products that conform to the requirements contained in the Department of Health and Human Services (DHHS) regulation 21 CFR subchapter J. The certification is indicated by a label located on the optical GLM, GBIC, 1x9 or small form factor transceiver.

In Europe, all optical GLMs, GBICs, 1x9 and small form factor transceivers sold by Emulex are certified as Class 1 laser component assemblies that conform to the requirements contained in the CENELEC (European Committee for Electrotechnical Standardization) standard EN60825-1:1994 (including amendment 11) and EN60825-2:1994. GLMs, GBICs, 1x9 and small form factor transceivers are certified by a recognized European testing agency and have appropriate markings on the assembly. The DHHS conformity label and European conformity mark will not be visible externally once the optical GLM, GBIC, 1x9 or small form factor transceiver is connected to or inserted in the host adapter and the adapter is installed into a system.

Labeling Requirements

No caution or danger labels are required for use of the GLM, GBIC, 1x9 or small form factor transceiver since they are Class 1 laser component assembly. In the U. S., the only laser safety label required is the DHHS certification label that already appears on the GLM, GBIC, 1x9 and small form factor transceiver. In Europe, the EN60825-1/EN60825-2 standards require that the system-level product has a Class 1 information label permanently attached and clearly visible whenever access to the GLM, GBIC, 1x9 and small form factor transceiver optical port is possible. Each Class 1 product shall have affixed an explanatory label bearing the words:

Alternatively, at the discretion of the manufacturer, the same statement may be included in user information. If a label is used, an example of the IEC Class 1 information label that is suitable for most European countries is shown below. The label consists of black printing on a white background. Languages represented on this label are English, German, Finnish and French, and they represent the minimum set for acceptance of a Class 1 product in most European countries.

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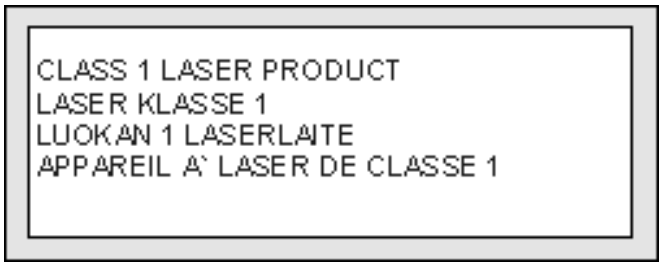

Product Information

GLM
GBIC
1 x 9 Transceiver
Small Form Factor Transceiver

GLM

The optical GLM is a single port communications card. Each communication port consists of a transmitter and receiver optical subassembly. The transmitter subassembly contains a semiconductor laser diode of gallium aluminum arsenide (GaAlAs). This material emits in the wavelength range of 770 to 860 nanometers for shortwave and 1270 to 1355 nanometers for long wave, and are commonly referred to as short wavelength (SW) or long wavelength (LW) lasers. The discrete laser diodes are classified as Class 3B laser products. Once they are incorporated into the GLM, the product's automatic power control maintains the average power launched into a fiber at a value below the Class 1 limit.

Note OFC GLMs are found only on the LP6000. Any reference to OFC or non-OFC products applies only to the LP6000, and not to other HBA models.

For OFC GLMs (Open Fiber Control) the optical fiber link between two GLM ports is continuously monitored by the open fiber link detection and laser safety control system (OFC). In the event of a break anywhere in the path, this control system prevents laser emissions from exceeding Class 1 levels. For non-OFC links, the optical power from the laser transmitter is controlled and maintained at a lower power level. The power emitted from either an open fiber or open laser transmitter is guaranteed to be below the Class 1 limit. Class 1 laser products are not considered hazardous. No user maintenance, service operations or adjustments can be performed on any GLM accessory.

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GBIC

The optical GBIC is an integrated duplex data link for bi-directional communications over multimode or single mode optical fiber. Each GBIC consists of a transmitter and receiver optical subassembly. The transmitter subassembly contains a semiconductor laser emitting in the wavelength range of 770 to 860 nanometers for shortwave length GBICs and 1270 to 1355 nanometers for long wavelength GBICs. For non-OFC links, the optical power from the laser transmitter is controlled and maintained at a lower power level. The power emitted from either an open fiber or open laser transmitter is guaranteed to be below the Class 1 limit. Class 1 laser products are not considered hazardous. No user maintenance, service operations or adjustments can be performed the GBIC.

Small Form Factor Transceiver

The small form factor transceiver is an integrated duplex data link for bi-directional communications over multimode or single mode optical fiber. Each small form factor transceiver consists of a transmitter and receiver optical subassembly. The transmitter subassembly contains a semiconductor laser emitting in the wavelength range of 770 to 860 nanometers for shortwave length small form factor transceivers and 1270 to 1355 nanometers for long wavelength small form factor transceivers. For non-OFC links, the optical power from the laser transmitter is controlled and maintained at a lower power level. The power emitted from either an open fiber or open laser transmitter is guaranteed to be below the Class 1 limit. Class 1 laser products are not considered hazardous. No user maintenance, service operations or adjustments can be performed the small form factor transceiver.

1x9 Transceiver

The 1x9 transceivers is an integrated duplex data link for bi-directional communications over multimode fiber. Each 1x9 consists of a transmitter and receiver optical subassembly. The transmitter subassembly contains a semiconductor laser emitting in the wavelength range of 770 to 860 nanometers for shortwave 1x9s. For non-OFC links, the optical power from the laser transmitter is controlled and maintained at a lower power level. The power emitted from either an open fiber or open laser transmitter is guaranteed to be below the Class 1 limit. Class 1 laser products are not considered hazardous. No user maintenance, service operations or adjustments can be performed the 1x9 transceiver.

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Usage Restrictions

Failure to comply with these usage restrictions may result in incorrect operation of the system and could possible lead to points of access that may emit laser radiation levels above the Class 1 limits established in the U. S. by the DHHS and within Europe by EN60825-1/EN60825-2.

GLM
GBIC
1 x 9 Transceiver
Small Form Factor Transceiver

GLM

The GLM is designed and certified for applications using point-to-point optical fiber links only. Use of the product with multiple input or multiple output optical links (for example, star couplers) is prohibited since it is incompatible with the GLM's certification.

The GLM will not allow normal data transmission on the optical link unless it is connected to another similar GLM or compatible laser product. For OFC GLMs, another manufacturer's laser product is not considered compatible unless it contains the open fiber link detection and laser safety control system (OFC) and is properly certified as a Class 1 laser product. Similarly, for non-OFC GLMs, a compatible laser device must be non-OFC.

Any system level product that incorporates the GLM must provide power supply protection that guarantees a voltage of 6.0 volts or less at the GLM. The functional power supply range of the GLM product is specified as 4.75 to 5.25 volts typically. Operation outside of this range may degrade the performance and lifetime of the GLM. The GLM will remain operational with laser emissions below Class 1 limits provided the power supply level at the adapter remains at or below 6.0 volts. If the power supply level rises above 6.0 volts, the GLM cannot be guaranteed to operate correctly and could result in laser emissions that may exceed Class 1 limits.

GBIC

Short wavelength and long wavelength GBICs allow normal data transmission on the optical link when they are connected to another compatible laser product. Short wavelength and long wavelength GBICs sold by Emulex as accessories are non-OFC devices. For non-OFC links, a compatible laser device must be non-OFC and certified as a Class 1 laser product.

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1 x 9 Transceiver

Short wavelength 1x9 transceivers allow normal data transmission on the optical link when they are connected to another compatible laser product. Short wavelength 1x9s embedded in Emulex host adapters are non-OFC. For non-OFC links, a compatible laser device must be non-OFC and certified as a Class 1 laser product.

Small Form Factor Transceiver

Short wavelength and long wavelength small form factor transceivers allow normal data transmission on the optical link when they are connected to another compatible laser product. Short wavelength and long wavelength small form factor transceivers embedded in Emulex host adapter are non-OFC. For non-OFC links, a compatible laser device must be non-OFC and certified as a Class 1 laser product.

Any system level product that incorporates the small form factor transceivers must provide power supply protection that guarantees a voltage of 5.0 volts or less at the small form factor transceivers. The functional power supply range of the small form factor transceivers product is specified as 3.135 to 3.465V typically. Operation outside of this range may degrade the performance and lifetime of the transceiver. The transceiver will remain operational with laser emissions below Class 1 limits provided the power supply level at the adapter remains at or below 5.0 volts. If the power supply level rises above 5.0 volts, the small form factor transceiver cannot be guaranteed to operate correctly and could result in laser emissions that may exceed Class 1 limits.

System Level Certification

All GLMs and GBICs sold as accessories by Emulex or host adapters containing embedded 1x9 or small form factor transceivers are certified as Class 1 laser products within the U.S. and Class 1 laser component assemblies outside of the U.S. Manufacturers of products properly incorporating the GLM, GBIC, 1x9 or small form factor transceiver do not need to recertify their product for laser safety. The procedure for full system certification is therefore identical to that used for any other electronic system. When applying for system level certification to electronic standards such as IEC950, the regulatory engineers may want to see the DHHS and European conformity labeling on the GLM, GBIC, 1x9 or small form factor transceiver, and the system level documentation and labeling. Copies of the certificate of conformity for any GLM, GBIC, 1x9 or small form factor transceiver sold by Emulex can be obtained upon request from Emulex Corporation, Costa Mesa.

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